

# Research Repository

## **Wage stagnation in leisure and hospitality during the cost-of-living crisis: The role of labor segmentation, cost burden, and structural constraints**

Accepted for publication in Journal of Sustainable Tourism.

Research Repository link: <https://repository.essex.ac.uk/41719/>

### **Please note:**

Changes made as a result of publishing processes such as copy-editing, formatting and page numbers may not be reflected in this version. For the definitive version of this publication, please refer to the published source. You are advised to consult the published version if you wish to cite this paper.

<https://doi.org/10.1080/09669582.2025.2570384>

# **Wage stagnation in leisure and hospitality during the cost-of-living crisis: The role of labor segmentation, cost burden, and structural constraints**

Wen Chang<sup>a\*</sup>, Xinyang Liu<sup>b</sup>, Gabrielle Lin<sup>c</sup>

<sup>a</sup> Department of Hospitality, Hotel Management and Tourism, Texas A&M University, College Station, TX, USA, [wen.chang@ag.tamu.edu](mailto:wen.chang@ag.tamu.edu)

<sup>b</sup> Newcastle Business School, Northumbria University, Newcastle upon Tyne, UK, [allen.liu@northumbria.ac.uk](mailto:allen.liu@northumbria.ac.uk)

<sup>c</sup> Edge Hotel School, University of Essex, Colchester, UK, [gabrielle.lin@essex.ac.uk](mailto:gabrielle.lin@essex.ac.uk)

\*Corresponding Author

## **Abstract**

The leisure and hospitality (L&H) industry, comprising the arts, entertainment, and recreation sector and the accommodation and food services sector, faces persistent workforce sustainability challenges, including poor working conditions, high turnover, and low wages. To advance L&H workforce sustainability, this study examines how the cost-of-living crisis affects wage vulnerability in this sector through the lens of the Labor Market Segmentation Theory (LMST). Using a panel dataset of U.S. industry-level statistics (2015–2024) using the Difference-in-Differences (DID) approach, we find that L&H wages fell significantly behind other sectors post-2022, widening the annual wage gap by \$5,976. Results reveal a structural pass-through of operational cost burdens onto employees, compounded by constraints such as a younger workforce, a high proportion of nonsupervisory roles, and low certification rates, reinforcing the sector's intensified vulnerability under macroeconomic shocks.

**Keywords:** Cost-of-living crisis, sustainable workforce, wage stagnation, cost burden, structural challenges

## 1. Introduction

The cost of living is a critical factor in understanding labor market dynamics, as it directly influences employment decisions, wage levels, and workforce sustainability, especially in tourism. Recent global events, including the COVID-19 pandemic, the energy crisis, and the surge in inflation, have significantly exacerbated the cost of living worldwide. In the United States, inflation peaked at approximately 9% in 2022 and had moderated by mid-2025, but the U.S. Consumer Price Index (CPI-U) still rose by 2.7% year-over-year as of June 2025, while core inflation (excluding food and energy) increased by 2.9% over the same period (U.S. Bureau of Labor Statistics, n.d.). It is widely acknowledged that the escalating cost of living has evolved into a crisis. Unlike in Europe, where some prices have stabilized, the rise in living costs in the U.S. persists, with food, gas, and electricity prices remaining elevated above the core CPI (U.S. Department of Agriculture, Economic Research Service, 2025). This cost-of-living crisis contributes to a range of socio-economic challenges, including deteriorating physical and mental health (England et al., 2024), rising poverty and inequality (O’Keeffe, 2024), financial strain on households (Hill & Webber, 2022), and increasing pressure on educational institutions (Lucas et al., 2023).

Comprising two sectors, arts, entertainment, and recreation (NAICS 71), and accommodation and food services (NAICS 72), the leisure and hospitality (L&H) super sector is commonly used in labor market research to represent the tourism and hospitality industry (Dogru et al., 2019, 2020; Huang et al., 2021). The tourism and hospitality industry plays a vital role in the global and U.S. economies, contributing over 9% to global GDP and employing more than 16 million people in the U.S. (Statista, 2023; U.S. Bureau of Labor Statistics, n.d.). Yet, despite its economic significance, the sector suffers from chronic labor instability. Quit rates have remained around 4%, well above the national average, and widespread staffing shortages persist across hotels and restaurants (U.S. Chamber of Commerce, 2024; American Hotel & Lodging Association, 2023). Low wages are also frequently cited as a primary barrier to developing a sustainable workforce (Baum et al., 2020). These vulnerabilities are further exacerbated by challenging working conditions, such as irregular hours, high stress, and limited job security, which contribute to high turnover rates (Liu-Lastres et al., 2023). Organizational factors such as weak leadership, limited career advancement, and low employment status also play a role (Liu-

Lastres et al., 2023), as do psychological factors like job dissatisfaction and burnout (Sun et al., 2022a; Chang & Busser, 2020).

While a substantial body of research has addressed these individual and organizational antecedents of turnover, far less attention has been given to the role of macro-level structural forces in shaping labor market outcomes in L&H. Broader economic dynamics, such as global inflation, labor market segmentation, and reduced consumer spending, are rarely incorporated into existing turnover frameworks (Baum et al., 2016; Ladkin et al., 2023). Yet these macro conditions can constrain employers' ability to respond to worker needs and exacerbate wage stagnation. The ongoing cost-of-living crisis intensifies this dilemma: as essential expenses surge, employees expect higher wages to preserve their purchasing power. However, L&H firms, heavily reliant on discretionary consumer spending, face financial constraints that limit their capacity to raise wages. This paradox creates a structural dilemma for the tourism and hospitality employees. Employees require wage adjustments for survival, while employers struggle to remain financially viable, limiting workforce sustainability in this sector. These conditions demand a theoretical shift from micro- and meso-level explanations to one that incorporates macroeconomic crises into our understanding of workforce instability.

Labor Market Segmentation Theory (LMST) is a classic structural economic theory that describes the divide between primary and secondary labor markets. Most applications of LMST focus on categorizing job types based on characteristics such as pay, stability, and mobility (Doeringer & Piore, 1970). While LMST has been widely accepted for understanding labor market structures, it has also been critiqued for its largely descriptive nature, limited dynamic explanatory power, and over reliance on static categorization (Peck, 1996; Núñez Hernández et al., 2024). Recent studies have called for more empirically dynamic applications of LMST (Cruz Gómez et al., 2019), particularly in examining how macro-environmental shocks reshape labor segmentation. Responding to this gap, the present study investigates how macroeconomic disruptions, such as the cost-of-living crisis, shape wage inequity in labor segments.

This study aims to investigate the economic impact of the cost-of-living crisis on labor wages within the leisure and hospitality (L&H) sector, a well recognized secondary labor market. Framed through the lens of LMST, it explores the institutional and structural drivers of wage

stagnation and wage vulnerability in the L&H sector. Precisely, the study addresses three core research questions:

- (1) What is the cost-of-living crisis's impact on wages in the L&H industry?
- (2) Through what mechanisms does this impact occur? Specifically, does wage stagnation result from declining productivity or from cost burdens being passed onto employees?
- (3) How do structural and workforce characteristics (e.g., age, job role, certification) shape wage vulnerability in the L&H sector?

These research questions inform the study's empirical strategy and guide the structure of the results section. The findings contribute to a deeper understanding of workforce resilience during cost-of-living crises and provide practical insights for both policymakers and industry practitioners in building a more sustainable workforce for the tourism industry.

## **2. Literature Review**

### **2.1 Crises in tourism and hospitality**

The L&H industry has long been recognized as one of the most crisis-sensitive sectors due to its reliance on mobility, consumer confidence, and discretionary income (Song et al., 2019). Over the past decades, it has endured repeated shocks, including financial recessions, health pandemics, geopolitical instability, and environmental disasters (Duan, 2022). These disruptions have exposed the sector's structural fragility and triggered far-reaching impacts on operational continuity, economic viability, and employment stability (Wut et al., 2021).

These economic crises, such as the 2008 global financial downturn, the COVID-19 pandemic, and the ongoing cost-of-living crisis, have shown particularly persistent and structural effects. Unlike short-term shocks, economic crises unfold gradually, exerting prolonged pressure on both consumers and businesses and making recovery timelines less predictable (Duan, 2022). In L&H, these crises translate into sustained reductions in travel demand, rising operational costs, and financial strain for both employers and employees (Alegre et al., 2013).

The existing literature on crisis impacts in tourism and hospitality has predominantly focused on the demand side, emphasizing changes in travel behavior, booking intentions, tourist

arrivals, and spending patterns during and after crisis events. A substantial body of work has examined how health risks, economic uncertainty, and safety concerns deter travel and suppress leisure expenditure (Çakar & Aykol, 2023; Wut et al., 2021). In contrast, supply-side impacts have received comparatively limited scholarly attention. Some recent studies have explored how crises disrupt labor supply, increase turnover, and lead to skill erosion in tourism and hospitality, particularly in sectors characterized by high informality, seasonality, or reliance on migrant labor (Robinson et al., 2019). The COVID-19 crisis, in particular, renewed attention to workforce vulnerabilities, as mass furloughs, staff shortages, and shifts in employee expectations emerged across the industry (Sun et al., 2022b). However, most of these studies adopt descriptive or correlational approaches, offering limited causal identification of crisis impacts on wages or productivity. Recent research has increasingly employed econometric and quasi-experimental designs to strengthen causal inference. For instance, difference-in-differences (DID) has been applied to examine minimum wage effects on the U.S. hotel industry (Song et al., 2022) and income shocks during COVID-19 (Maiti, 2023). Other approaches include panel regressions with fixed effects to isolate structural determinants of wages (Dogru et al., 2019), input–output decomposition to trace sectoral cost linkages (Shu et al., 2022), and synthetic control methods for evaluating policy impacts (Arkhangelsky et al., 2021). However, such techniques have rarely been applied to the cost-of-living crisis or to multi-sector comparisons, leaving a gap in understanding how wage disparities evolve under macroeconomic shocks.

This supply-side gap is particularly pronounced in relation to labor economy outcomes. Although the sector is widely recognized for low wages, insecure contracts, and limited progression (Dogru et al., 2019), few studies assess how macroeconomic crises intensify these conditions. Quantitative evidence on crisis-driven wage stagnation and productivity shifts remains scarce. This limit understanding of how crises reshape the sector’s internal dynamics beyond consumer behavior to include the economic realities of workers and employers. Addressing this gap is crucial for evidence-based workforce policy and sustainable recovery planning.

## **2.2 Cost-of-living crisis and wage pressure**

The cost of living refers to the financial resources needed to meet basic household needs, including housing, food, healthcare, and transportation (Diewert, 1990). Recent surges in living

expenses have significantly reduced consumer purchasing power and affected labor market dynamics (Holzer, 2019; Howell & Kalleberg, 2019). In labor markets, rising living costs influence both labor supply and demand. Employees may feel compelled to remain in low-wage jobs due to financial necessity, while employers struggle to adjust wages amid escalating operational expenses.

In the L&H sector, this wage pressure is especially acute. With labor costs representing a significant share of overall operating expenses and profit margins often thin, many businesses are unable to provide proportional wage increases to match inflation. This creates a dual vulnerability. Employees face stagnant wages amid rising living expenses, while employers confront rising cost burdens that threaten financial sustainability. Consequently, labor shortages, reduced job attractiveness, and higher employee turnover become more prevalent (Castro-Palaganas & Spitzer, 2017).

### **2.3 Labor market segmentation and L&H workforce**

Labor Market Segmentation Theory (LMST) provides a useful framework for understanding how the cost-of-living crisis impacts workers in the L&H sectors. According to LMST, labor markets are not homogenous but rather segmented into distinct categories based on factors such as skill level, training, and institutional structures. An internal labor market exists within organizations or skilled professions, where wages and employee mobility are influenced more by institutional structures, training, and career progression rather than external competitive market forces (Doeringer & Piore, 1970). LMST divides the broader labor market into two segments: the primary labor market, characterized by high wages, job security, and career growth, and the secondary labor market, where jobs tend to be low-wage, low-skill, and lack stability and benefits (Doeringer & Piore, 1970; Piore, 1978). The L&H workforce predominantly falls within the secondary labor market, as many jobs in this sector require limited formal education or specialized training and offer low wages with little long-term career progression (Baum, 2018). LMST provides a structural lens to explain why low-skill, low-mobility workers in L&H are most exposed during economic shocks like a cost-of-living crisis.

Both employers and employees in the secondary labor market are disadvantaged under economic pressure, such as during the cost-of-living crisis. The cost-of-living crisis poses significant challenges for employers in the L&H sector, many of whom operate within tight

financial constraints. Unlike businesses in the primary labor market, which may have more financial flexibility, L&H enterprises function with relatively thin profit margins due to high operating costs, seasonal fluctuations, and intense market competition (Zhang & Xie, 2023). Given these structural limitations, increasing wages to offset the rising cost of living presents a considerable financial burden. Many employers in this sector also rely heavily on seasonal and flexible employment, making it difficult to implement long-term labor policies or establish stable career progression pathways (Robinson et al., 2019). Career advancement opportunities are generally confined to employees working for large national or international hospitality chains, while those employed in smaller businesses face fewer options for professional growth. These factors collectively make talent retention a persistent challenge, particularly as workers seek higher wages and greater financial stability elsewhere (Piore, 2018).

From the employees' perspective, LMST explains why those in secondary markets are particularly vulnerable to exogenous shocks such as the cost-of-living crisis. When wages in this sector often fail to keep pace with rising living expenses, many workers are compelled to seek employment in industries that offer better compensation or relocate to regions with lower living costs. However, this presents a significant dilemma, as many major tourist destinations are also high-cost areas, limiting workers' ability to remain employed in the industry. As a result, cross-industry labor mobility becomes a common response, with workers transitioning from L&H to other secondary labor markets that provide greater financial security (Mooney & Ryan, 2009).

## **2.4 Structural constraints and cost burdens**

Wages are a foundational component of workforce sustainability and retention. As a hygiene factor in job satisfaction, insufficient compensation can lead to dissatisfaction and turnover, even when other job aspects are positive. Prior literature identifies four primary determinants of wages: (1) macroeconomic trends and labor market conditions, (2) wage-setting institutions, (3) dominant economic theories, and (4) policy frameworks (Dunlop & Segrave, 2016). Theoretical perspectives provide additional insights into wage formation. Human capital theory frames wages as a return on employees' skills, education, and productivity (Willis, 1986), while equity theory emphasizes fairness in relative compensation, both within and across organizations (Rees, 1993). Perceived inequities, whether internal or external, can erode morale and influence retention (Torre, Pelagatti & Solari, 2015).

In L&H, however, these determinants interact with structural constraints. Same level educated workers in this sector earn consistently lower wages than their peers in other industries, indicating a sector-specific penalty in returns to education (Oliver & Sard, 2020). This wage gap is partially mitigated in regions with higher tourism specialization (Garcia & Porto, 2022). Gender is also a factor. Research suggest gender wage disparities in the tourism and hospitality industry are shaped by occupational segregation, organizational structures, and discrimination (Casado-Díaz, Driha & Simón, 2022).

Another possible mechanism driving wage stagnation is the pass-through of cost burdens. As noted above, during cost-of-living crises, L&H employers face increased costs without the pricing power to offset them. Given the industry's labor-intensive model and historically thin profit margins, firms may respond by freezing wages or limiting raises. Studies show that L&H wages are less responsive to national wage trends and do not track overall economic performance (Dogru et al., 2019). Similarly, data from China suggest that wage levels are shaped by factors like final demand, industrial linkages, and labor's share of value added, with variation across sub-sectors (Shu et al., 2022). These findings underscore that wage suppression is not solely a result of managerial discretion but reflects deeper institutional and structural limitations embedded in the sector.

These complications underscore the structural vulnerability of the L&H workforce during a cost-of-living crisis. However, prior studies have not empirically demonstrated how macroeconomic shocks interact with institutional labor structures to reproduce wage stagnation. Contrary to the expectation that inflationary pressures result in higher wages, this study proposes that the L&H sector experiences limited wage adjustments due to several interconnected mechanisms. Specifically, we examine whether wage stagnation arises from declining labor productivity, employers passing increased cost burdens, or institutional and workforce characteristics, such as job roles, employee age, and credentialing, that constrain bargaining power and wage progression. By unpacking these mechanisms, this study moves LMST beyond its traditional descriptive function, offering a more dynamic account of how economic crises reinforce labor segmentation and wage inequity in structurally fragile industries.

### 3. Methodology and Data

#### 3.1. Research design

The research focuses on understanding the economic consequences of the cost-of-living crisis on the L&H industry and how these effects compare to other sectors. Given that the L&H industry has a distinct labor market characterized by lower wages, higher turnover rates, and a substantial proportion of nonsupervisory employees, it is essential to examine whether these structural factors exacerbate wage disparities and production cost absorption post-crisis. This study is structured around three primary research questions:

First, it examines the impact of the cost-of-living crisis on annual wages in the L&H industry compared to other sectors. The purpose is to determine whether wage disparities widened post-2022, indicating that L&H employees bore a disproportionate burden of economic shocks. To analyze this, the Difference-in-Differences (DID) method is employed as a quasi-experimental assessment (Viglia & Dolnicar, 2020), utilizing industry-specific data to estimate wage changes relative to other sectors while controlling for pre-existing trends (Song et al., 2022; Liu et al., 2024). This allows a causal interpretation of wage divergence rather than a simple descriptive comparison.

Second, the study explores whether L&H employees experienced a decline in productivity after the crisis, or if they absorbed rising production costs without significant productivity loss. This question is examined using a DID model on labor productivity, assessing whether the output per employee in the L&H industry changed post-crisis. Additionally, a panel regression on producer price index (PPI) is conducted to determine whether increased production costs were reflected in reduced wages rather than decreased productivity (Dogru et al., 2020). This step directly links productivity dynamics to wage outcomes, clarifying whether lower pay reflects efficiency changes or cost-transfer mechanisms.

Third, the study investigates why L&H employees are particularly vulnerable to economic crises, focusing on institutional and structural factors such as job hierarchy, workforce age, and certification levels. Using panel regression with slope dummy variables and t-tests, the study identifies whether these structural labor differences contribute to weaker wage protections and lower bargaining power in the L&H industry compared to other sectors. This analysis explains the labor market segmentation mechanisms that amplify wage suppression during crises.

### 3.2 Data

This study utilizes a panel dataset comprising industry-level data spanning from 2015 to 2024, covering ten major industries as classified by the U.S. Bureau of Labor Statistics (BLS), including: (1) mining and logging, (2) construction, (3) manufacturing, (4) trade, transportation, and utilities, (5) information, (6) financial activities, (7) professional and business services, (8) education and health services, (9) leisure and hospitality (L&H), and (10) other services. Considering data consistency and comprehensive coverage of employment, wages, productivity, and cost-related factors, the BLS is used as the main data source.

According to the North American Industry Classification System (NAICS), the L&H supersector combines the arts, entertainment, and recreation (NAICS 71) section and accommodation and food services (NAICS 72) section. While this classification captures the core supply-side components of the tourism and hospitality workforce, it does not encompass the full breadth of the tourism industry, which also includes demand-side sectors such as transportation, travel arrangement services, and parts of retail. Nevertheless, the L&H category is commonly used in labor market research to represent tourism and hospitality due to its consistency, data availability, and close alignment with service-oriented employment associated with tourism activities (Dogru et al., 2019, 2020; Huang et al., 2021; McGinley et al., 2024). This study treats L&H as a single analytical group to reflect the structural similarities across its subsectors, namely, high turnover, low wages, and limited career progression, which are central to understanding workforce vulnerability. The decision also ensures comparability with official U.S. labor statistics and supports robust econometric modeling using aggregated industry-level data.

Inflation is proxied using the U.S. GDP deflator, sourced from the World Bank. Key explanatory variables, including total factor productivity, labor productivity, the producer price index (PPI), and capital intensity, are indexed to 2017 (=100) to allow standardized temporal comparisons. Unionization and human capital metrics—such as the share of nonsupervisory employees and the percentage with certifications or licenses—are expressed as percentages.

Some BLS variables were not initially available at the aggregated industry level. To address this, we applied weighted aggregation based on labor and output shares. For example, the PPI was constructed using gross output weights for trade, transportation, and utilities, while

service sectors were aggregated from representative product-level PPIs. In education and health services, the PPI for health was used as a proxy. Labor productivity and capital intensity were weighted by hours worked, and total factor productivity and capital-labor-energy-material shares were aggregated by gross output. This ensures internally consistent and comparable sector-level estimates across the dataset.

### 3.3 Model specification

#### 3.3.1 Impact analysis of the cost-of-living crisis on wages

The DID method is employed to estimate the effect of the cost-of-living crisis on wages in the L&H industry. This approach allows for the comparison of wage changes before and after the crisis across L&H and other industries, helping to isolate the impact of the economic shock. The model is specified as follows:

$$Wage_{i,t} = \alpha + \beta_1 L\&H_i \times Post_t + \beta_2 Unemployment_{i,t} + \beta_3 TFP_{i,t} + \beta_4 Union_{i,t} + \beta_5 avgWH_{i,t} + \beta_7 Def_t + \gamma_i + \delta_t + \varepsilon_{i,t}. \quad (1)$$

where  $Wage_{i,t}$  represents employees' average annual wage in industry  $i$  in year  $t$ . The  $L\&H_i * Post_t$  is the interaction term in the DID method added to account for the cost-of-living impact on the L&H industry, in which  $ind_i$  and  $Post_t$  are the dummy variables represent the L&H industry and the time of cost-of-living crisis (started from 2022), respectively. The  $Unemployment_{i,t}$ ,  $TFP_{i,t}$ ,  $Union_{i,t}$ ,  $avgWH_{i,t}$ , and term  $Def_t$  represent control variables including unemployment rate, TFP, unionization, weekly average hours worked, and the national GDP deflator.

The unemployment rate is included as it serves as a key macroeconomic indicator influencing wage adjustments (Ehrenberg & Oaxaca, 1976). In the context of the DID model, it accounts for external labor market fluctuations that could otherwise confound the estimated impact of the cost-of-living crisis on wages. A higher unemployment rate often increases labor supply, leading to downward pressure on wages, while a lower rate could signal stronger bargaining power for employees. TFP is incorporated to capture efficiency-driven wage growth mechanisms (Van Beveren, 2012). Given that industries with higher TFP typically exhibit stronger wage growth due to productivity-linked compensation structures, including this variable ensures that wage changes are not mistakenly attributed to the crisis when, in fact, they may stem from sector-specific productivity gains. Unionization is a critical determinant of wage rigidity

and bargaining power within labor markets (Card, 2001). In the DID framework, its inclusion controls for the possibility that unionized workers in certain industries may experience greater wage stability, mitigating crisis-induced wage fluctuations. A lower degree of unionization in the L&H sector may exacerbate wage vulnerability, reinforcing the necessity of controlling for this factor. Average weekly hours worked is integrated as it serves as an indicator of labor input intensity, which directly influences earnings (Rupert & Zanella, 2015). Accounting for this variable allows the DID estimates to isolate wage responses from employment hour adjustments, ensuring a more precise interpretation of wage changes in response to the crisis.

To adjust the wage with inflation changes, the time series of the GDP deflator is added which is the same for each industry but vary over time.  $\alpha$  is the overall intercept.  $\beta_1$  is the coefficient to be estimated, indicating the net effect of the cost-of-living crisis on employee's annual wage in the T&H versus other industries. The rest of  $\beta$  terms coordinate the effect of control variables on industries average wage. Two-way fix effect is considered.  $\gamma_i$  denote the unobservable differences of the wage cross each industry, and  $\delta_t$  is the fix effect on time dimension.  $\varepsilon_{i,t}$  represents the unexplainable error term across industries and time.

To test the robustness and validity of the DID results, conducting the parallel trend and placebo tests is the common practice (Liu et al., 2024). A key prerequisite for applying the DID method is that the treatment and control groups display parallel trends prior to the intervention. Building on the initial DID analysis, this study developed a dynamic model by incorporating pre- and post-crisis dummy variables to test the validity of the parallel trends assumption.

$$Wage_{i,t} = \alpha + \sum_{t=2016}^{t=2023} \beta_t ind_i \times T_t + \eta X_{i,t} + \theta_i + \vartheta_t + \varepsilon_{i,t}. \quad (2)$$

where  $T_t$  represents the dummy variable that includes the six years ahead and two years after the cost-of-living crisis occurred, from 2016 to 2023. Multiply with the time dummy variable, the industry dummy variable is also incorporated to create the interaction term to indicate the L&H industry's annual average wage during the investigation period. Meanwhile, the coefficient  $\beta_t$  during the crisis period demonstrates the net impact of the cost-of-living crisis on the employees' average annual wage of the L&H industry compared to that of the other sectors. Therefore, if the coefficients of the interaction term  $\beta_t$  during the pre-crisis period is insignificantly different from

zero, it means that the wage between L&H and the other industries presented a parallel trend.  $X_{i,t}$  is the matrix including all the control variables, and  $\eta$  denotes the corresponding coefficient vector. Time and group effects are also accounted in the regression.

Another way to test the validity of the DID results is known as a “Placebo test”, which also tests whether the estimation result is affected by other unobservable variables (Arkhangelsky et al., 2021). It performs the additional DID estimations using a fake treatment group, that is, each of the nine non-L&H industries in this study, to check the zero impact between the comparison group and the fake treatment group. The Placebo test is specified as:

$$\hat{\beta} = \beta_0 + \sigma^* \frac{cov(L\&H \times post, \varepsilon|X)}{var(L\&H^* \times post^*|X)}. \quad (3)$$

where  $\hat{\beta}$  is the estimated impact of the intervention in equation (1).  $\sigma^*$  represents the impact of the unobserved factors on the cost-of-living crisis on the employee’s wage level in the L&H industry. By bootstrapping the industry and year,  $L\&H^*$  and  $post^*$  are randomized and paired together to construct the fake treatment setting.  $X$  incorporates all the control variables and fixed effects in the model.

### 3.3.2 Labor productivity and production costs analysis

A similar DID approach is applied to labor productivity to determine whether the L&H industry experienced a decline in productivity following the crisis or if workers maintained productivity levels despite potential wage reductions. This analysis is crucial for understanding whether the observed wage adjustments reflect changes in worker efficiency or simply a redistribution of financial burdens onto employees. The model is specified as follows:

$$LP_{i,t} = \alpha + \beta_1 L\&H_i \times Post_t + \beta_2 CapInten_{i,t} + \beta_3 avgWH_{i,t} + \beta_7 Def_t + \gamma_i + \delta_t + \varepsilon_{i,t}. \quad (4)$$

where  $LP_{i,t}$  represents labor productivity. The inclusion of capital intensity, represented by  $CapInten_{i,t}$  accounts for differences in industry capital investment, ensuring that wage and productivity changes are not confounded by variations in capital-labor ratios (Sharma et al., 2016). Average hours worked controls for changes in labor input, which can influence productivity independently of wage adjustments (Benavides-Chicón & Ortega, 2014). Deflation-adjusted industry output is included to control for sector-wide economic conditions that might otherwise drive productivity fluctuations.

To examine whether increasing production costs have been passed onto L&H employees through wage reductions, a panel regression is employed. The model is specified as follows:

$$\begin{aligned} Wage_{i,t} = & \alpha + \beta_1 PPI_{i,t} + \beta_2 PPI_{i,t} \times Post_t + \beta_3 PPI_{i,t} \times Post_t \times L\&H_i \\ & + \beta_4 Unemployment_{i,t} + \beta_5 TFP_{i,t} + \beta_6 Union_{i,t} + \beta_7 avgWH_{i,t} + \gamma_i + \delta_t \\ & + \varepsilon_{i,t}. \end{aligned} \quad (5)$$

The inclusion of PPI ensures that cost fluctuations at the industry level are accounted for employee's annual wage. The interaction term  $PPI_{i,t} \times Post_t \times L\&H_i$  captures whether L&H industries disproportionately absorbed higher production costs through wage reductions post-crisis. Additional control variables such as unemployment, TFP, unionization rate, and the weekly average working hours are included to account for labor market conditions and industry productivity differences that could otherwise bias the results.

### 3.3.3 Institutional and structural factors analysis

To analyze the role of institutional and structural factors in wage determination across industries, a panel regression is conducted to identify which factors significantly affect wages. Furthermore, the model assesses whether these determinants function differently in the L&H industry compared to other sectors. The specification is as follows:

$$\begin{aligned} Wage_{i,t} = & \alpha + (\beta_1 + \beta_1^* D_{L\&H}) NSEE_{i,t} + (\beta_2 + \beta_2^* D_{L\&H}) WMEE_{i,t} + (\beta_3 + \beta_3^* D_{L\&H}) MAEE_{i,t} \\ & + (\beta_4 + \beta_4^* D_{L\&H}) CLEE_{i,t} + \beta_5 Def_t + \gamma_i + \delta_t + \varepsilon_{i,t}. \end{aligned} \quad (6)$$

where  $NSEE_{i,t}$  represents the percentage of nonsupervisory employees,  $WMEE_{i,t}$  is the female worker's percentage to the workforce,  $MAEE_{i,t}$  denotes the median workforce age, and  $CLEE_{i,t}$  captures the employees' certification/licensure rate among each industry sector. The inclusion of these variables accounts for individual employee attributes that influence wage determination. The interaction terms between L&H and human capital factors allow for the assessment of whether wage-setting mechanisms differ in the L&H industry compared to other sectors. A significant coefficient on  $D_{L\&H} \times CLEE_{i,t}$ , for instance, would suggest that certification-based wage premiums or deductions differ between L&H and other industries, highlighting structural wage disparities.

The findings from the panel regression guide the subsequent *t*-test analysis, where significant institutional and structural factors identified in the regression model are compared between L&H and other industries. This *t*-test serves to verify whether differences in workforce attributes, such as a lower percentage of certified employees or a younger workforce, contribute to wage disparities. If *t*-test results indicate significant differences in these characteristics, it strengthens the argument that labor market segmentation plays a role in wage suppression in the L&H industry.

## **4. Results**

### **4.1 Wage effects of the cost-of-living crisis in L&H**

Table 1 presents the DID model results for the impact of cost-of-living crisis on industry annual wages. The results reveal a significant negative impact of the cost-of-living crisis on wages in the L&H sector. The coefficient for the interaction term (L&H × Post) is -5976.124 ( $p = 0.018$ ), indicating that post-2022, employees in the L&H industry experienced an annual wage trajectory that diverged further from other industries by approximately \$5,976. This suggests that the wage disparity between L&H and other sectors widened, exacerbating pre-existing challenges in tourism-related employment.

The control variables in the DID model for annual wages show that total factor productivity (TFP) and inflation adjustments (Def) significantly influence wages, aligning with expectations that higher productivity and inflation adjustments drive wage increases. Conversely, unemployment, union presence, and average working hours (avgWH) do not show significant effects, suggesting that broader labor market conditions and unionization did not play a decisive role in wage changes. The negative constant value indicates that, without these factors, baseline wages would be significantly lower, emphasizing the importance of industry-specific and macroeconomic influences.

**Table 1.** DID model results for annual wages

Variable	Coefficient	Std. Error	Significance
L&H × Post	-5,976.124	2,497.102	0.018**
Unemployment	304.148	1,634.450	0.853
TFP	258.387	70.291	0.000***
Union	162.924	451.994	0.719
avgWH	1,014.900	642.295	0.117
Def	669.299	288.028	0.022**
Constant	-89,901.880	53,064.380	0.093*

Industrial FE: Yes.

Time FE: Yes.

$R^2 = 0.4836$ .

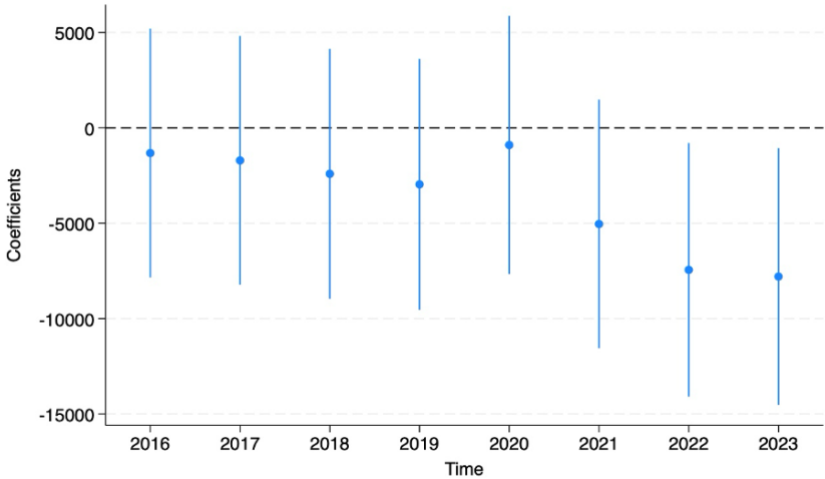
$N = 140$ .

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

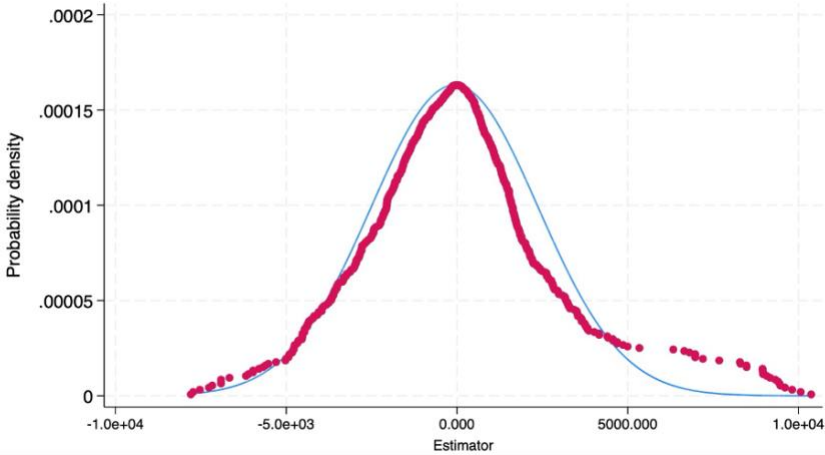
The robustness checks support the validity of the DID model. The parallel trend test (Figure 1) confirms that wage trajectories between the L&H sector and other industries exhibited no significant differences in the pre-crisis period (2016–2021). The coefficients for the interaction terms (L&H × Pre-crisis) were statistically insignificant, indicating that the wage patterns were parallel before the 2022 cost-of-living crisis. This suggests that the observed post-2022 wage divergence is not a continuation of a historical trend but rather a direct consequence of the economic shocks that emerged during and after the cost-of-living crisis. By isolating the timing of this divergence, the analysis strengthens the causal interpretation that the L&H sector’s wage decline was an acute, crisis-driven effect rather than part of a pre-existing structural wage trajectory.

A placebo test was conducted to further assess the potential influence of unobservable factors on the model outcomes. This test involved simulating the estimates of the interaction term by applying fabricated crisis years and treatment industries in the DID model. After 500 simulations, the placebo results reveal that the DID coefficients were centered around zero and followed a normal distribution (see Figure 2). This outcome infers that when no actual crisis or treatment effect is present, the model’s estimates fluctuate randomly around zero rather than showing systematic bias. Therefore, the observed significant effects in the actual analysis are less likely due to unobservable external factors or model misspecification. Instead, these significant

effects are likely attributable to the true impact of the actual crisis, reducing concerns about confounding variables driving the results.



**Figure 1.** Parallel trend test on annual wages



**Figure 2.** Placebo test on annual wages

These robustness checks confirm that the DID model reliably captures the impact of the cost-of-living crisis on L&H wages and supports the validity of the observed wage divergence as a consequence of the economic event rather than coincidental or hidden trends. The model findings underscore the heightened vulnerability of L&H workers to macroeconomic shocks, as their earnings were disproportionately affected compared to other industries.

## 4.2 Labor productivity and cost absorption

The widening wage disparity between the L&H sector and other industries has intensified existing challenges within the tourism-related employment sector following the cost-of-living crisis in 2022. This trend raises important considerations regarding its underlying causes, particularly whether it resulted from a decline in L&H productivity or an increased transfer of production costs onto employees. Understanding these factors is crucial to assessing the long-term implications for wage structures and employment conditions in the industry.

### 4.2.1 Labor productivity changes in the L&H industry

As shown in Table 2, the DID analysis on labor productivity indicates that the individual output of L&H employees did not significantly diverge from other industries post-2022. The L&H  $\times$  Post coefficient is 6.302 ( $p = 0.225$ ), indicating no significant change in labor productivity. This finding suggests that declining wages in L&H were not driven by lower productivity but rather by other cost-related factors. Key determinants of labor productivity include capital intensity (CapInten,  $p < 0.001$ ), average working hours (avgWH,  $p < 0.001$ ), and inflation adjustments (Def,  $p < 0.001$ ), all of which significantly influence productivity.

**Table 2.** DID model results for labor productivity

Variable	Coefficient	Std. Error	Significance
L&H $\times$ Post	6.301695	5.17003	0.225
CapInten	1.476701	.1994352	0.000***
avgWH	-4.639507	1.259778	0.000***
Def	.4439108	.0837433	0.000***
Constant	84.52094	59.88715	0.161

Industrial FE: Yes.

Time FE: Yes.

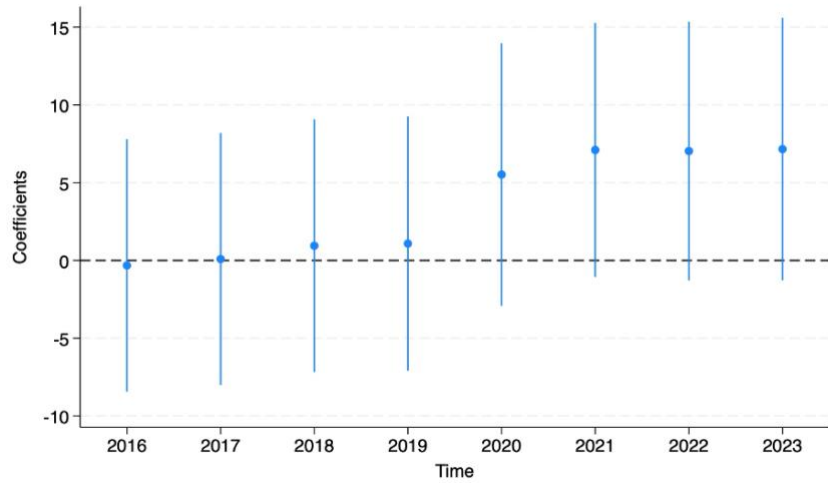
$R^2 = 0.1662$ .

$N = 140$ .

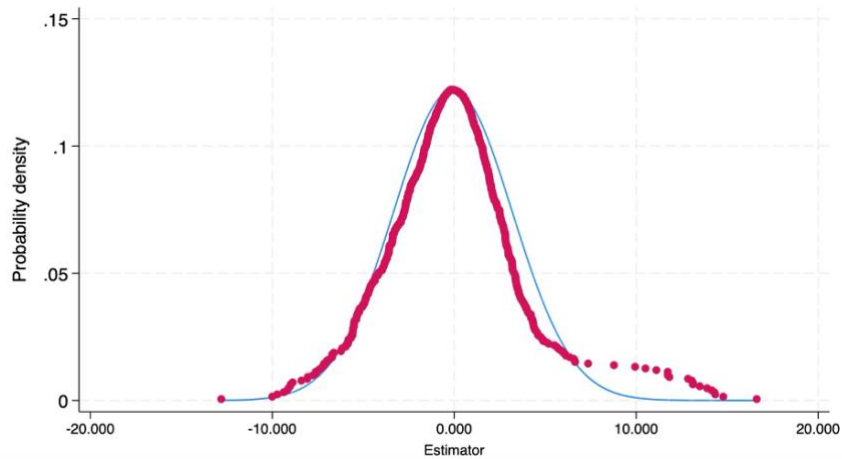
\*\*\*  $p < 0.01$ .

The robustness checks, including the parallel trend (see Figure 3) and placebo tests (see Figure 4), confirm the validity of the DID model, ensuring that the unobserved productivity fluctuation does not overlook significant underlying trends. The lack of a significant productivity

decline further strengthens the argument that the wage reduction in the L&H industry stems from increased cost burdens rather than reduced worker efficiency.



**Figure 3.** Parallel trend test on labor productivity



**Figure 4.** Placebo test on labor productivity

#### 4.2.2 Impact of producer costs on employee wages

The panel regression analysis of PPI on annual wages highlights the role of rising production costs in shaping wage trends within L&H (see Table 3). The coefficient of PPI is not statistically significant ( $p = 0.856$ ), meaning that general producer price changes do not have a strong direct influence on wages across industries. This result suggests that broader inflationary pressures at the producer level alone may not be a major determinant of wage adjustments, possibly because businesses in general absorb cost fluctuations through mechanisms other than

wage reductions. The interaction term  $\text{PPI} \times \text{Post}$  captures the effect of producer price inflation after the cost-of-living crisis in 2022. The significantly negative coefficient ( $-269.251, p < 0.001$ ) indicates that, after the crisis, an increase in PPI was strongly associated with a substantial decline in annual wages. One possible explanation could be that after the crisis, inflationary pressures may have escalated, leading businesses to transfer cost increases onto employees by reducing real wages. In the meantime, the presence of economic instability may have weakened workers' bargaining power, enabling firms to adjust wages downward in response to rising production costs.

The coefficient of  $\text{PPI} \times \text{Post} \times \text{L\&H}$  represents a three-way interaction between PPI, the post-crisis period, and the L&H industry, capturing how wage responses to producer cost inflation differ specifically within the L&H sector after 2022. The negative and statistically significant coefficient ( $-71.853, p < 0.001$ ) shows that, within L&H, producer price increases led to a greater reduction in wages compared to other industries in the post-crisis period. Such a pattern could imply that the L&H sector is more vulnerable to cost shocks due to its reliance on low-wage labor and high operating costs. Specifically, L&H businesses, particularly hotels, restaurants, and tourism services, often operate with tight profit margins (Toker, 2025), meaning they may pass cost increases onto workers more aggressively than firms in other sectors. The results may also suggest that the elasticity of labor demand in L&H is higher, so when costs rise, businesses may reduce wages, cut employee hours, or limit hiring more than other industries. These all mirror the limited bargaining power of L&H employees.

**Table 3.** Panel regression model: PPI for annual wages

Variable	Coefficient	Std. Error	Significance
PPI	-10.713	58.962	0.856
PPI × Post	-269.251	65.231	0.000***
PPI × Post × L&H	-71.853	19.142	0.000***
Unemployment	-9,773.830	1,239.208	0.000***
TFP	113.669	76.444	0.140
Union	358.045	411.969	0.387
avgWH	280.288	721.423	0.698
Constant	116,200.200	35,128.470	0.001***

Industrial FE: Yes.

Time FE: Yes.

$R^2 = 0.3633$ .

$N = 140$ .

\*\*\*  $p < 0.01$ .

In summary, instead of absorbing higher costs, firms in L&H responded by transferring financial pressures onto their employees. The negative wage effects observed in this sector illustrate a structural weakness, where price shocks translate into direct income reductions for workers rather than adjustments in operational strategies.

### 4.3 Structural constraints on wage vulnerability

To reiterate, the cost-of-living crisis deepened wage disparities between the L&H sector and other industries, amplifying existing challenges within tourism-related employment. While one potential cause could be a decline in productivity, the findings indicate that labor productivity in L&H remained unchanged, suggesting that the wage gap was amplified by the disproportionate transfer of rising production costs onto L&H employees during the cost-of-living crisis. This raises a critical question: why were L&H employees particularly vulnerable to these cost shifts? A key factor to consider is their bargaining power, which may be constrained by structural characteristics of the L&H workforce. To better understand this vulnerability, the relationship between human capital attributes and wage levels is examined, shedding light on the factors that contribute to L&H workers' limited ability to negotiate better wages and working conditions.

Table 4 presents the panel regression results on institutional and structural factors across industries, reinforcing the observed structural disadvantages of L&H employees. Additionally, Table 5 presents the independent *t*-test results comparing key factors between L&H and other industries, highlighting the disparities in employee roles, median age, and certification rates. These differences are also visualized in Figure 5.

The panel regression results indicate that industries with a higher proportion of nonsupervisory employees experience lower wage levels (NSEE coefficient = -762.622,  $p = 0.094$ ). Given that the L&H industry has a significantly greater proportion of nonsupervisory employees than other sectors (87.7% vs. 79.1%,  $p < 0.001$ ), this structural factor contributes to wage suppression, as nonsupervisory roles are typically less compensated (Gould, 2020). The insignificance of gender composition (WMEE) in influencing wages may result from regulated wage structures in some sectors reducing gender-based wage disparities (Schäfer & Gottschall, 2015), diluting the effect of gender composition in an industry-wide analysis.

Another critical determinant is workforce median age, which is positively associated with higher wages (MAEE coefficient = 2,476.631,  $p = 0.018$ ), implying the experience and tenure-based wage effects across industries (Caplin et al., 2022). However, the interaction term  $D_{L\&H} \times MAEE$  is negative (-6,224.473,  $p = 0.054$ ), indicating that tenure-based wage growth is weaker in L&H than in other industries. The younger median age of L&H employees (31.7 years vs. 42.7 years,  $p < 0.001$ ) further exacerbates wage disparities, as these workers have limited bargaining power and fewer opportunities for long-term earnings growth. This age disparity reflects the industry's appeal to younger, less experienced workers, potentially due to more flexible working conditions and lower entry barriers (Addison, 2014).

Additionally, certification rate is a significant contributor of wage levels (CLEE coefficient = 726.078,  $p = 0.081$ ), which supports the view that increased human capital correlates with better compensation (Psacharopoulos & Patrinos, 2018; Velayutham & Rahman, 2018). Nevertheless, the L&H industry lags behind other sectors in terms of employee certification (9.2% vs. 22.2%,  $p < 0.001$ ). This suggests that a lack of formal qualifications may also contribute to lower wage resilience in L&H, as workers lack credentials that could enhance their bargaining power and earning potential.

**Table 4.** Panel regression model: Human capital factors for annual wages

<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>Significance</b>
NSEE	-762.622	449.705	0.094*
WMEE	112.367	685.448	0.870
MAEE	2,476.631	1,022.398	0.018**
CLEE	726.078	409.931	0.081*
D <sub>L&amp;H</sub> × NSEE	665.499	2,156.424	0.759
D <sub>L&amp;H</sub> × WMEE	1,825.072	3,197.225	0.570
D <sub>L&amp;H</sub> × MAEE	-6,224.473	3,179.551	0.054*
D <sub>L&amp;H</sub> × CLEE	1,949.803	3,880.220	0.617
Def	691.282	44.012	0.000***
Constant	-83,361.670	80,918.080	0.306

Industrial FE: Yes.

Time FE: No.

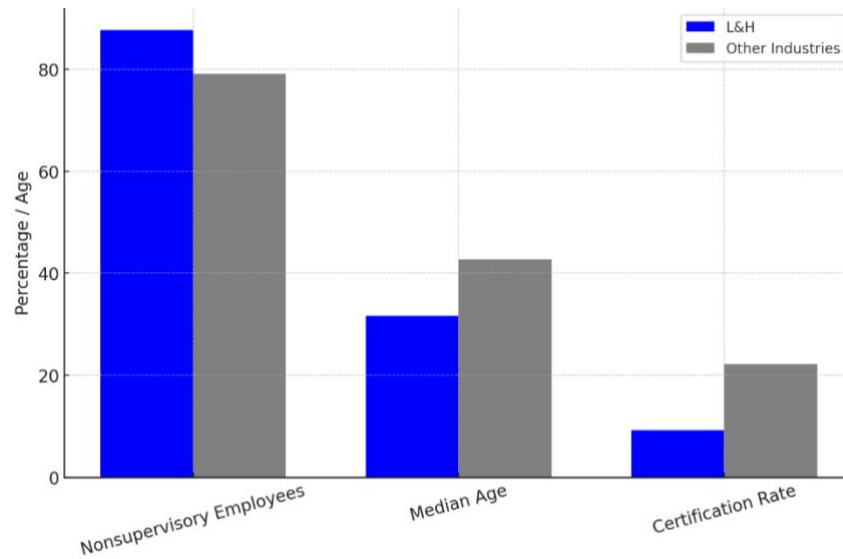
$R^2 = 0.3397$ .

$N = 90$ .

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 5.** T-test results: Human capital factors in L&H vs. other industries

<b>Variable</b>	<b>L&amp;H Mean</b>	<b>Other Industries Mean</b>	<b><i>t</i> Statistic</b>	<b>Significance</b>
Nonsupervisory employees (%)	87.7	79.1	16.484	0.000
Median age (years)	31.7	42.7	-65.144	0.000
Certification rate (%)	9.2	22.2	-10.339	0.000



**Figure 5.** Human capital factors

## 5. Discussion and Conclusion

The results highlight the distinct economic vulnerabilities of the L&H sector during the 2022 cost-of-living crisis. Compared to other industries, L&H wages not only stagnated but fell behind, suggesting sector-specific structural weaknesses in workforce compensation and career mobility. The significant negative coefficient on the  $L\&H \times Post$  interaction term in the DID model indicates that L&H struggled to adjust wages in line with inflation, unlike other sectors that managed partial compensation. This wage lag raises concerns about the industry's ability to attract and retain talent during economic shocks, signaling challenges to achieving sustainable workforce development. (Baum, 2019).

The wage disparities in L&H are not merely a response to external economic shocks but rather indicative of systemic labor market inequalities. The DID interaction of  $PPI \times Post \times L\&H$  reveals that rising costs were disproportionately transferred to workers rather than absorbed by firms or balanced by productivity gains. This supports LMST's view of structurally segmented labor markets (Piore, 2018), where wage suppression is a default response to financial pressure. Addressing these constraints requires not only HR reforms but broader structural adjustments, including technological adoption to improve efficiency (Acemoglu & Restrepo, 2018; Sharma et al., 2016). The structural constraints of the L&H workforce compound these issues. A

predominance of nonsupervisory roles and a younger labor pool weaken bargaining power and limit wage growth. Low certification rates and weak tenure-wage relationships further diminish long-term career prospects (Boella & Goss-Turner, 2019). Targeted investment in workforce development, skill certification, and advancement pathways is needed to mitigate these vulnerabilities.

The wage suppression and cost-transfer mechanisms observed in this study are not confined to the U.S. labor market. Similar patterns have been documented across other tourism-based economies. For instance, Casado-Díaz and Simón (2016) and Oliver and Sard (2021) highlight persistent wage gaps and segmented labor conditions in Spain's hospitality sector, while Baum et al. (2020) argue that COVID-19 acted as an accelerant of long-standing workforce precarity in global hospitality systems. In Canada, Murray et al. (2017) underscore the industry's chronic labor shortages and reliance on younger, low-paid workers, further reinforcing the vulnerability of the tourism labor force. Walmsley et al. (2019) similarly observe that hospitality firms in the UK, faced with minimum wage legislation, shifted employment strategies rather than structurally improving working conditions, illustrating a pattern of cost transfer to labor. Maiti (2023) provides quantitative evidence from India showing a near 59% wage loss among tourism and hospitality workers post-COVID, further reinforcing the global consistency of this wage suppression trend. Collectively, these studies support our interpretation that the cost-of-living crisis did not create new disparities, but rather magnified structural disadvantages inherent to the sector. As such, the findings presented here may be indicative of broader labor market patterns across tourism-intensive economies, lending further validity and international relevance to our conclusions.

### **5.1 Theoretical contributions**

This study conceptually and empirically extends LMST by incorporating the dynamic effects of macroeconomic shocks on wage stagnations in service-based secondary labor markets, with a focus on the L&H industry. While LMST traditionally distinguishes between primary and secondary labor markets, its application remains largely static and underdeveloped in accounting for external economic turbulence and sector-specific vulnerabilities (Peck, 1996; Cruz Gómez et al., 2019; Núñez Hernández et al., 2024). In this study, we were able to advance LMST through three perspectives:

First, we introduce and empirically operate cost burden pass-through as a novel structural mechanism, whereby rising production costs, such as those triggered by the cost-of-living crisis, are disproportionately transferred to employees in structurally vulnerable service sectors like L&H. Using a panel dataset across the U.S. L&H industry and a difference-in-differences design, we empirically demonstrate how rising production costs, triggered by the cost-of-living crisis, are more likely to be shifted onto employees in the L&H sector. This mechanism enriches LMST by moving beyond static duality and theorizing a dynamic link between cost shocks and intra-segment wage suppression.

Second, moving beyond LMST's generalized duality, we theorize that structural constraints, together with the macroeconomic shocks, enhance the labor market inequality. Our results show that the effect of the cost-of-living crisis on labor segmentation is not spread uniformly across different labor markets, even across different secondary labor markets (e.g., other secondary labor markets other than L&H). Instead, it is conditioned by workforce composition (e.g., job hierarchy, workforce age, and certification levels). These structural constraints shape each sector's capacity to buffer wage pressures during economic shocks, offering a more contingent and dynamic interpretation of labor segmentation processes. This theoretical refinement positions LMST as a more contingent, multi-dimensional model that incorporates sectoral and compositional nuances.

Third, this study moves beyond reaffirming LMST's descriptive utility by empirically demonstrating its limitations during real-time macroeconomic disruptions. While LMST has traditionally framed labor segmentation as a persistent structural condition, our findings suggest it also operates as a dynamic process that interacts with external economic volatility. Specifically, we show that labor segmentation intensifies in response to macro-level cost shocks, and that this process varies across sectors with different workforce characteristics. This interpretation enriches LMST by introducing a shock-sensitive perspective to labor segmentation, offering new conceptual pathways for theorizing labor vulnerability and resilience under systemic crises.

Taken together, these contributions not only reposition LMST from a largely static and descriptive framework toward one that can account for dynamic, crisis-induced wage disparities but also offer novel theoretical and empirical foundations for understanding labor segmentation

and workforce sustainability in the tourism and hospitality industry. Our findings go beyond merely validating the core assumptions of LMST. They extend LMST's analytical power by demonstrating how macroeconomic shocks interact with sector-specific constraints to intensify labor segmentation. This refined perspective provides conceptual tools for theorizing labor vulnerability under systemic disruptions and offers practical implications for workforce policy, labor protections, and sustainable workforce development.

## **5.2 Practical implications**

This study provides critical insights for advancing workforce sustainability in the L&H sector. While the cost-of-living crisis has intensified longstanding structural vulnerabilities, our findings show that these issues are not episodic but embedded in the sector's labor architecture. To foster a sustainable workforce, interventions must go beyond short-term relief and address the deeper institutional and structural roots of precarity.

First of all, L&H wages are systematically lower than those in other sectors, partially due to occupational segmentation and limited bargaining power. Moreover, economic shocks exacerbate these inequities. Addressing this dual challenge requires both government-level strategies and tailored labor management procedures. Rather than relying solely on broad calls for higher pay, operators can take concrete steps such as conducting regular wage benchmarking against cost-of-living indices and local competitors to identify systematic gaps. Our results also highlight the need to rethink tipping practices. While there is growing debate in the U.S. around eliminating tipping (Kelly, 2023), a simple removal may create unintended consequences. Instead, the sector would benefit from a structured compensation system that integrates base wages with performance incentives, offering greater income stability for workers. While tourism and hospitality organizations often lack the financial ability to improve the compensation conditions for their employees, the government should consider tax incentives to incentivize small and medium-sized L&H businesses to raise wages without jeopardizing their daily operations.

Second, our findings underscore structural barriers to wage progression, such as low certification rates. To counter this, policymakers, industry associations and educational institutions should invest in career development frameworks, including standardized training and certification programs that create clearer paths for advancement within the L&H workforce. At

the operational level, tourism and hospitality organizations should support employees in obtaining industry-recognized certifications, thereby strengthening their qualifications and enhancing their prospects for higher pay.

Moreover, to align with the Sustainable Development Goals, particularly SDG 8 (Decent Work and Economic Growth) and SDG 10 (Reduced Inequalities), tourism recovery grants and destination development funds should also be tied to enforceable labor protections. Conditional funding can incentivize fair employment practices, ensuring that economic recovery also promotes social sustainability. At the operational level, tourism and hospitality organizations can demonstrate compliance by conducting wage audits, adopting transparent pay scales, offering flexible scheduling, and documenting retention and training initiatives, thereby linking funding requirements to verifiable workforce practices.

### **5.3 Limitations and future research**

Despite providing valuable insights into the impact of the cost-of-living crisis on wages in the L&H industry, this study has several limitations that should be acknowledged.

First, it relies on aggregate industry-level data, which limits understanding of firm-level responses and individual employee experiences. Future research could use micro-level or case study data to capture variation by business size, geography, and employment type. Second, behavioral dimensions such as job satisfaction, perceived security, and career-switching intent are not considered. Survey or experimental designs could enrich understanding of how workers respond to wage stagnation. Third, while the DID approach captures the causal relationships, it does not isolate the root causes of the crisis. Structural modeling or decomposition techniques could identify specific cost drivers more precisely. The study also treats L&H as a single sector due to NAICS classification and data constraints, leaving intra-sectoral differences unexplored. Future research could disaggregate subsectors and include related industries like transport and travel services for a broader tourism labor perspective. Additionally, findings are based on U.S. data and may not generalize globally. Comparative studies could examine how different labor systems mediate wage responses. Finally, long-term effects remain unknown; future longitudinal research should explore how businesses adapt through automation or new compensation models to ensure workforce resilience.

## References

- Acemoglu, D., & Restrepo, P. (2018). Artificial intelligence, automation, and work. In A. Agrawal, J. Gans, & A. Goldfarb (Eds.), *The economics of artificial intelligence: An agenda* (pp. 197-236). University of Chicago Press.
- Addison, P. (2014, November 10). The hospitality industry has much to offer young people. *HR Magazine*. <https://www.hrmagazine.co.uk/content/features/the-hospitality-industry-has-much-to-offer-young-people>
- Alegre, J., Mateo, S., & Pou, L. (2013). Tourism participation and expenditure by Spanish households: The effects of the economic crisis and unemployment. *Tourism Management*, 39, 37-49. <https://doi.org/10.1016/j.tourman.2013.04.002>
- American Hotel & Lodging Association. (2023, December). *67% of surveyed hotels report staffing shortages, over 70,000 hotel jobs unfilled nationwide*. American Hotel & Lodging Association. <https://www.ahla.com/news/67-surveyed-hotels-report-staffing-shortages>
- Arkhangelsky, D., Athey, S., Hirshberg, D. A., Imbens, G. W., & Wager, S. (2021). Synthetic difference-in-differences. *American Economic Review*, 111(12), 4088-4118. <https://doi.org/10.1257/aer.20190159>
- Baum, T. (2018). Sustainable human resource management as a driver in tourism policy and planning: a serious sin of omission? *Journal of Sustainable Tourism*, 26(6), 873-889. <https://doi.org/10.1080/09669582.2017.1423318>
- Baum, T. (2019). Does the hospitality industry need or deserve talent? *International Journal of Contemporary Hospitality Management*, 31(10), 3823-3837. <https://doi.org/10.1108/IJCHM-10-2018-0805>

- Baum, T., Kralj, A., Robinson, R. N., & Solnet, D. J. (2016). Tourism workforce research: A review, taxonomy and agenda. *Annals of Tourism Research*, 60, 1-22.  
<https://doi.org/10.1016/j.annals.2016.04.003>
- Baum, T., Mooney, S. K., Robinson, R. N., & Solnet, D. (2020). COVID-19's impact on the hospitality workforce—new crisis or amplification of the norm? *International Journal of Contemporary Hospitality Management*, 32(9), 2813-2829.  
<https://doi.org/10.1108/IJCHM-04-2020-0314>
- Benavides-Chicón, C. G., & Ortega, B. (2014). The impact of quality management on productivity in the hospitality sector. *International Journal of Hospitality Management*, 42, 165-173. <https://doi.org/10.1016/j.ijhm.2014.07.004>
- Boella, M. J., & Goss-Turner, S. (2019). *Human resource management in the hospitality industry: A guide to best practice* (10th ed.). Routledge.
- Çakar, K., & Aykol, Ş. (2023). The past of tourist behaviour in hospitality and tourism in difficult times: A systematic review of literature (1978–2020). *International Journal of Contemporary Hospitality Management*, 35(2), 630-656. <https://doi.org/10.1108/IJCHM-12-2021-1475>
- Caplin, A., Lee, M., Leth-Petersen, S., Saeverud, J., & Shapiro, M. D. (2022). *How worker productivity and wages grow with tenure and experience: The firm perspective* (NBER Working Paper No. 30342). National Bureau of Economic Research.  
<https://doi.org/10.3386/w30342>
- Card, D. (2001). The effect of unions on wage inequality in the U.S. labor market. *ILR Review*, 54(2), 296-315. <https://doi.org/10.2307/2696012>

- Casado-Díaz, J. M., & Simón, H. (2016). Wage differences in the hospitality sector. *Tourism Management, 52*, 96-109. <https://doi.org/10.1016/j.tourman.2015.06.015>
- Casado-Díaz, J. M., Driha, O., & Simón, H. (2022). The gender wage gap in hospitality: New evidence from Spain. *Cornell Hospitality Quarterly, 63*(3), 399-417. <https://doi.org/10.1177/1938965520971273>
- Castro-Palaganas, E., Spitzer, D. L., Kabamalan, M. M. M., Sanchez, M. C., Caricativo, R., Runnels, V., Labonté, R., Murphy, G. T., & Bourgeault, I. L. (2017). An examination of the causes, consequences, and policy responses to the migration of highly trained health personnel from the Philippines: The high cost of living/leaving—a mixed method study. *Human Resources for Health, 15*, 25. <https://doi.org/10.1186/s12960-017-0198-z>
- Chang, W., & Busser, J. A. (2020). Hospitality career retention: The role of contextual factors and thriving at work. *International Journal of Contemporary Hospitality Management, 32*(1), 193-211. <https://doi.org/10.1108/IJCHM-10-2018-0831>
- Cruz Gómez, I., Molina Romo, Ó., Verd Pericàs, J. M., Palauskaite, E., Dumčius, R., Venckutė, M., Patrini, V., & Vacas Soriano, C. (2019). *Labour market segmentation: Piloting new empirical and policy analyses*. European Foundation for the Improvement of Living and Working Conditions.
- Diewert, W. E. (1990). The theory of the cost-of-living index and the measurement of welfare change. *Contributions to Economic Analysis, 196*, 79-147.
- Doeringer, P. B., & Piore, M. J. (1970). *Internal labor markets and manpower analysis*. Heath Lexington Books.
- Dogru, T., McGinley, S., & Kim, W. G. (2020). The effect of hotel investments on employment in the tourism, leisure and hospitality industries. *International Journal of Contemporary*

*Hospitality Management*, 32(5), 1941-1965. <https://doi.org/10.1108/IJCHM-11-2019-0913>

Dogru, T., McGinley, S., Line, N., & Szende, P. (2019). Employee earnings growth in the leisure and hospitality industry. *Tourism Management*, 74, 1-11.

<https://doi.org/10.1016/j.tourman.2019.02.008>

Duan, J., Xie, C., & Morrison, A. M. (2022). Tourism crises and impacts on destinations: A systematic review of the tourism and hospitality literature. *Journal of Hospitality & Tourism Research*, 46(4), 667-695. <https://doi.org/10.1177/1096348021994194>

Dunlop, J., & Segrave, M. (2016). *The theory of wage determination*. Springer International Publishing.

Ehrenberg, R. G., & Oaxaca, R. L. (1976). Unemployment insurance, duration of unemployment, and subsequent wage gain. *The American Economic Review*, 66(5), 754-766.

England, C., Jarrom, D., Washington, J., Hasler, E., Batten, L., Edwards, A., & Lewis, R. (2024). Methodological approaches to measuring mental health in a cost-of-living crisis: A rapid review. *Health Policy (Amsterdam, Netherlands)*, 144, 105062.

<https://doi.org/10.1016/j.healthpol.2024.105062>

Garcia, C. I., & Porto, N. (2022). Tourism specialisation and education: Leading the way to better labour conditions? *Tourism Economics*, 28(8), 2068-2081.

<https://doi.org/10.1177/13548166211029052>

Gould, E. (2020, February 20). *State of working America wages 2019: A story of slow, uneven, and unequal wage growth over the last 40 years*. Economic Policy Institute.

<https://www.epi.org/publication/swa-wages-2019/>

- Hill, K., & Webber, R. (2022). *From pandemic to cost of living crisis: Low-income households in challenging times*. Joseph Rowntree Foundation.
- Holzer, H. J. (2019). *The U.S. labor market in 2050: Supply, demand and policies to improve outcomes* (IZA Policy Paper No. 148). IZA Institute of Labor Economics.
- Howell, D. R., & Kalleberg, A. L. (2019). Declining job quality in the United States: Explanations and evidence. *RSF: The Russell Sage Foundation Journal of the Social Sciences*, 5(4), 1-53. <https://doi.org/10.7758/rsf.2019.5.4.01>
- Huang, A. Y., Fisher, T., Ding, H., & Guo, Z. (2021). A network analysis of cross-occupational skill transferability for the hospitality industry. *International Journal of Contemporary Hospitality Management*, 33(12), 4215-4236. <https://doi.org/10.1108/IJCHM-01-2021-0073>
- Kelly, J. (2023, August 1). *Tipflation: Americans think tipping culture is out of control and employees should be paid more*. Forbes. <https://www.forbes.com/sites/jackkelly/2023/08/01/tipflation-americans-think-tipping-culture-is-out-of-control-and-employees-should-be-paid-more/>
- Ladkin, A., Mooney, S., Solnet, D., Baum, T., Robinson, R., & Yan, H. (2023). A review of research into tourism work and employment: Launching the Annals of Tourism Research curated collection on tourism work and employment. *Annals of Tourism Research*, 100, 103554. <https://doi.org/10.1016/j.annals.2023.103554>
- Liu-Lastres, B., Wen, H., & Huang, W. J. (2023). A reflection on the Great Resignation in the hospitality and tourism industry. *International Journal of Contemporary Hospitality Management*, 35(1), 235-249. <https://doi.org/10.1108/IJCHM-05-2022-0551>

- Liu, X., Liu, A., Jiao, X., & Liu, Z. (2024). The impact of policy intervention on international wine demand. *International Journal of Contemporary Hospitality Management*, 36(8), 2728-2751. <https://doi.org/10.1108/IJCHM-08-2023-1275>
- Lucas, M., Classick, R., Skipp, A., & Julius, J. (2023). *Cost of living crisis: Impact on schools*. National Foundation for Educational Research.
- Maiti, A. (2023). Impact of COVID-19 on individual income in tourism and hospitality industry in India: A difference-in-differences approach. *Tourism Economics*, 29(7), 1790-1811. <https://doi.org/10.1177/13548166221140629>
- McGinley, S., Dogru, T., & Sharma, A. (2024). The effect of job abundance on tourism employee turnover. *International Journal of Hospitality Management*, 119, 103718. <https://doi.org/10.1016/j.ijhm.2024.103718>
- Mooney, S., & Ryan, I. (2009). A woman's place in hotel management: upstairs or downstairs? *Gender in Management: An International Journal*, 24(3), 195-210. <https://doi.org/10.1108/17542410910950877>
- Murray, W. C., Elliot, S., Simmonds, K., Madeley, D., & Taller, M. (2017). Human resource challenges in Canada's hospitality and tourism industry: Finding innovative solutions. *Worldwide Hospitality and Tourism Themes*, 9(4), 391-401. <https://doi.org/10.1108/WHATT-04-2017-0022>
- Núñez Hernández, F., Usabiaga, C., & Álvarez de Toledo, P. (2024). Labour market segmentation and the gender wage gap in Spain. *International Journal of Manpower*, 45(10), 16-41. <https://doi.org/10.1108/IJM-10-2023-0601>

- O’Keeffe, P. (2024). Economic inequality and the “cost of living” crisis. In J. Smith & R. Brown (Eds.), *Power, privilege and place in Australian society* (pp. 101-126). Springer Nature Singapore.
- Oliver, X., & Sard, M. (2021). Gender wage gap in hospitality. *Journal of Hospitality & Tourism Research*, 45(2), 345-372. <https://doi.org/10.1177/1096348020909423>
- Peck, J. (1996). *Work-place: The social regulation of labor markets*. Guilford Press.
- Piore, M. J. (1978). Dualism in the labor market: A response to uncertainty and flux—the case of France. *Revue Économique*, 29(1), 26-48. <https://doi.org/10.3406/reco.1978.408371>
- Piore, M. J. (2018). The dual labor market: Theory and implications. In D. B. Grusky (Ed.), *Social stratification* (pp. 629-640). Routledge.
- Psacharopoulos, G., & Patrinos, H. A. (2018). Returns to investment in education: A decennial review of the global literature. *Education Economics*, 26(5), 445-458. <https://doi.org/10.1596/1813-9450-8402>
- Rees, A. (1993). The role of fairness in wage determination. *Journal of Labor Economics*, 11(1), 243-252. <https://doi.org/10.1086/298325>
- Robinson, R. N., Martins, A., Solnet, D., & Baum, T. (2019). Sustaining precarity: critically examining tourism and employment. *Journal of Sustainable Tourism*, 27(7), 1008-1025. <https://doi.org/10.1080/09669582.2018.1538230>
- Rupert, P., & Zanella, G. (2015). Revisiting wage, earnings, and hours profiles. *Journal of Monetary Economics*, 72, 114-130. <https://doi.org/10.1016/j.jmoneco.2015.02.001>
- Schafer, A., & Gottschall, K. (2015). From wage regulation to wage gap: How wage-setting institutions and structures shape the gender wage gap across three industries in 24

- European countries and Germany. *Cambridge Journal of Economics*, 39(2), 467-496.  
<https://doi.org/10.1093/cje/bev005>
- Sharma, A., Motta, V. E. D., Choi, J. G., & Altman, N. S. (2016). Economic production in hospitality and tourism industry: How do we compare to other services? *International Journal of Contemporary Hospitality Management*, 28(5), 1026-1050.  
<https://doi.org/10.1108/IJCHM-07-2014-0316>
- Shu, H., Yu, Q., Liu, K., Wang, A., & Zha, J. (2022). Understanding wage differences across tourism-characteristic sectors: Insights from an extended input-output analysis. *Journal of Hospitality and Tourism Management*, 51, 88-104.  
<https://doi.org/10.1016/j.jhtm.2022.02.030>
- Song, H. J., Yeon, J., Lee, S., & Li, Z. (2022). The effect of an increase in federal minimum wage on the US hotel industry: A difference-in-differences approach. *Current Issues in Tourism*, 25(6), 887-900. <https://doi.org/10.1080/13683500.2021.1903402>
- Song, H., Qiu, R. T., & Park, J. (2019). A review of research on tourism demand forecasting: Launching the Annals of Tourism Research curated collection on tourism demand forecasting. *Annals of Tourism Research*, 75, 338-362.  
<https://doi.org/10.1016/j.annals.2018.12.001>
- Statista. (2023). *Global tourism – Statistics & facts*. Statista. Retrieved August 10, 2025, from <https://www.statista.com/topics/962/global-tourism/>
- Sun, J., Chang, W., Nazlan, N. H., Wang, C., & Wang, L. (2022). Chinese event students' career: The role of career awareness and career self-efficacy. *Event Management*, 26(4), 883-898. <https://doi.org/10.3727/152599521X16367300695627>

- Sun, Y. Y., Li, M., Lenzen, M., Malik, A., & Pomponi, F. (2022). Tourism, job vulnerability and income inequality during the COVID-19 pandemic: A global perspective. *Annals of Tourism Research Empirical Insights*, 3(1), 100046.  
<https://doi.org/10.1016/j.annale.2022.100046>
- Toker, T. (2025). The operating profit flow method as a profitability analysis tool for hospitality enterprises. *International Journal of Hospitality Management*, 125, 103997.  
<https://doi.org/10.1016/j.ijhm.2024.103997>
- Torre, E. D., Pelagatti, M., & Solari, L. (2015). Internal and external equity in compensation systems, organizational absenteeism and the role of explained inequalities. *Human Relations*, 68(3), 409-440. <https://doi.org/10.1177/0018726714528730>
- U.S. Bureau of Labor Statistics. (n.d.). *Consumer price index (CPI)*. Retrieved July 29, 2025, from <https://www.bls.gov/cpi/>
- U.S. Chamber of Commerce. (2024, December). *Understanding America's labor shortage: The most impacted industries*. <https://www.uschamber.com/workforce/understanding-americas-labor-shortage-the-most-impacted-industries>
- U.S. Department of Agriculture, Economic Research Service. (2025, July 25). *Food price outlook – Summary findings*. Retrieved July 29, 2025, from <https://www.ers.usda.gov/data-products/food-price-outlook/summary-findings>
- Van Beveren, I. (2012). Total factor productivity estimation: A practical review. *Journal of Economic Surveys*, 26(1), 98-128. <https://doi.org/10.1111/j.1467-6419.2010.00631.x>
- Velayutham, A., & Rahman, A. R. (2018). The value of human capital within Canadian business schools. *Journal of Intellectual Capital*, 19(4), 836-855. <https://doi.org/10.1108/JIC-06-2017-0086>

- Viglia, G., & Dolnicar, S. (2020). A review of experiments in tourism and hospitality. *Annals of Tourism Research*, 80, 102858. <https://doi.org/10.1016/j.annals.2020.102858>
- Walmsley, A., Partington, S., Armstrong, R., & Goodwin, H. (2019). Reactions to the national living wage in hospitality. *Employee Relations*, 41(1), 253-268.  
<https://doi.org/10.1108/ER-02-2018-0044>
- Willis, R. J. (1986). Wage determinants: A survey and reinterpretation of human capital earnings functions. In O. Ashenfelter & R. Layard (Eds.), *Handbook of labor economics* (pp. 525-602). North-Holland.
- Wut, T. M., Xu, J. B., & Wong, S. M. (2021). Crisis management research (1985–2020) in the hospitality and tourism industry: A review and research agenda. *Tourism Management*, 85, 104307. <https://doi.org/10.1016/j.tourman.2021.104307>
- Zhang, D., & Xie, J. (2023). Influence of tourism seasonality and financial ratios on hotels' exit risk. *Journal of Hospitality & Tourism Research*, 47(4), 714-733.  
<https://doi.org/10.1177/10963480211016038>